

Chapter 4

The Input-Output Impact Multipliers

An impact multiplier is defined as the ratio of the industry's or project's total impact to its direct impact. Expressed as single numbers, multipliers are used as a quick reference for a summary measure of the estimated total impact; they thus lack industrial details.

There are numerous types of I-O impact multipliers, Table 4-1 shows the four most widely utilized multipliers obtained from the aggregated three-sector 1997 Washington input-output table presented in the previous chapters (Table 1-1, Table 3-1, and Table 3-2).

Table 4-1
1997 WASHINGTON STATE INPUT-OUTPUT MULTIPLIERS
Three-Sector Model

Industry (SIC)	Total Jobs (per \$million direct output)	Total Employment (per direct job)	Total Labor Income (per \$ direct output)	Total Output (per \$ direct output)
Natural resource	27.453	1.767	0.6442	1.9994
Manufacturing	13.501	2.738	0.4804	1.7616
Trade and services	24.696	1.966	0.7343	2.0307

The formal definitions of these multipliers are:

1. **Total jobs multiplier** (jobs per \$million direct output). Total number of jobs (wage and salary workers, and proprietors) generated in all sectors of the economy per million dollars of direct output change in the industry.
2. **Total employment multiplier** (jobs per direct job). Total number of jobs (wage & salary workers and proprietors) generated in all sectors of the economy per direct job change in the industry.
3. **Labor income multiplier** (\$earnings per \$dollar direct output). Total labor income (wages, salaries, proprietors' income and other labor income) generated in all sectors of the economy per dollar of direct output change in the industry.
4. **Total output multiplier** (\$output per \$dollar direct output). Total output generated in all sectors of the economy per dollar of direct output change in the industry.

Multipliers for all the industries defined in the Washington State Input-Output Table are reported in Table 4-2. Again, as discussed in Chapter 3, the input-output model is a Type II model, which treats households as an endogenous part of the model. So the multipliers presented here are Type II multipliers.

Table 4-2a
WASHINGTON STATE INPUT-OUTPUT MULTIPLIERS, 1997
SIC-Based Industries

Industry	Total Jobs (per \$million direct output)	Total Employment (per direct job)	Total Labor Income (per \$ direct output)	Total Output (per \$ direct output)
1. Field crops, fruits, and vegetables	30.732	1.553	0.5618	1.9160
2. Livestock and products	30.906	2.703	0.7110	2.4909
3. Fishing and forestry	22.308	1.990	0.6575	1.8634
4. Mining	22.260	2.072	0.6994	1.9080
5. Food products	18.717	4.302	0.5083	2.1666
6. Textiles and apparel	23.988	1.655	0.5523	1.7126
7. Lumber and wood products	22.245	3.934	0.7033	2.5480
8. Furniture and fixtures	28.707	2.122	0.7800	2.2152
9. Pulp and paper products	17.101	4.679	0.6023	2.4022
10. Printing and publishing	24.752	2.383	0.7215	2.1228
11. Chemicals and products	15.053	4.631	0.5649	2.0207
12. Petroleum and products	1.898	4.875	0.0710	1.1701
13. Stone, clay, and glass products	20.555	2.786	0.6371	2.1490
14. Primary metals	11.039	3.465	0.3939	1.8388
15. Fabricated metals	16.535	2.131	0.5051	1.7067
16. Industrial machinery & equipment	18.386	2.440	0.6236	1.8451
17. Electrical machinery	15.779	2.605	0.5202	1.7680
18. Aircraft and parts	10.028	2.635	0.4010	1.4798
19. Ship and boat building and repair	19.202	2.289	0.7544	1.8140
20. Other transportation equipment	11.569	2.466	0.3889	1.5399
21. Instruments	20.309	2.549	0.7498	1.9489
22. Other manufacturing	18.932	1.844	0.5268	1.6976
23. Construction	24.570	2.226	0.7499	2.0497
24. Transportation services	20.316	2.383	0.6380	1.9450
25. Electric utilities	10.972	4.948	0.4282	1.9151
26. Gas utilities	4.597	3.834	0.2208	1.5268
27. Other utilities	18.713	3.372	0.7489	2.1306
28. Communications	15.174	3.037	0.6034	1.7266
29. Wholesale trade	21.595	2.465	0.6799	1.9553
30. Eating and drinking places	42.010	1.462	0.7136	2.0960
31. Other retail trade	31.814	1.786	0.7167	2.0655
32. Finance and insurance	23.578	3.010	0.7222	2.2296
33. Real estate	17.954	2.706	0.4378	1.9374
34. Hotels and lodging	32.170	1.596	0.7139	1.9349
35. Computer & data processing	17.465	3.813	0.8293	1.9591
36. Business & professional services	34.486	1.869	0.9561	2.1716
37. Health services	31.828	2.056	1.0141	2.2282
38. Other services	44.752	1.760	0.9283	2.4265
Labor earnings	18.932		0.4814	1.3656

Table 4-2b
WASHINGTON STATE INPUT-OUTPUT MULTIPLIERS, 1997
NAICS-Based Industries

Industry	Total Jobs (per \$million direct output)	Total Employment (per direct job)	Total Labor Income (per \$ direct output)	Total Output (per \$ direct output)
1. Crop production	30.032	1.598	0.5835	1.9280
2. Animal production	30.603	2.624	0.7266	2.4643
3. Forestry and fishing	22.110	1.972	0.6594	1.8706
4. Logging	23.134	3.994	0.7165	2.5267
5. Mining	21.784	2.118	0.6975	1.9344
6. Electric utilities	10.996	4.958	0.4357	1.9183
7. Gas utilities	6.371	5.307	0.2698	1.5735
8. Other utilities	19.616	3.532	0.7596	2.1239
9. Construction	23.725	2.184	0.7348	2.0331
10. Food manufacturing	18.827	3.971	0.5211	2.1568
11. Textiles and apparel manufacturing	23.407	1.676	0.5682	1.7455
12. Wood product manufacturing	23.208	4.028	0.7187	2.5366
13. Paper manufacturing	17.887	4.759	0.6214	2.3850
14. Printing	24.026	2.220	0.7092	2.0791
15. Petroleum and products manufacturing	2.145	5.189	0.0784	1.1772
16. Chemical manufacturing	15.404	4.164	0.5768	2.0110
17. Nonmetallic mineral products manuf.	20.167	2.714	0.6334	2.1280
18. Primary metals manufacturing	11.295	3.438	0.4053	1.8423
19. Fabricated metals manufacturing	16.558	2.182	0.5348	1.7425
20. Machinery manufacturing	17.996	2.358	0.6166	1.8372
21. Computer & electronic product manuf.	17.434	2.466	0.6126	1.8376
22. Electrical equipment manufacturing	15.813	2.528	0.5355	1.7872
23. Aircraft and parts manufacturing	9.793	2.561	0.4007	1.4786
24. Ship and boat building	18.924	2.240	0.7534	1.8126
25. Other transportation equipment manuf.	12.125	2.393	0.4105	1.5709
26. Furniture and related product manuf.	25.912	2.467	0.7389	2.3048
27. Other manufacturing	19.615	2.037	0.5856	1.8332
28. Wholesale trade	20.844	2.373	0.6747	1.9503
29. Retail trade	29.944	1.791	0.7135	2.0485
30. Transportation and warehousing	20.154	2.297	0.6394	1.9488
31. Information	16.637	3.322	0.7461	1.8991
32. Finance and insurance	22.631	2.866	0.7188	2.2168
33. Real estate	19.362	2.501	0.4822	1.9619
34. Professional services and management	28.573	1.987	0.8337	2.1233
35. Educational services	42.583	1.718	0.9161	2.3954
36. Health services	32.842	1.949	0.9651	2.2428
37. Arts, recreation, and accommodation	37.396	1.679	0.8211	2.1945
38. Food services and drinking places	40.686	1.471	0.7173	2.0909
39. Other services	39.262	1.750	0.8694	2.3242
Labor earnings	18.196		0.4818	1.3579